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PILLSBURY WINTHROP SHAW PITTMAN, LLP
P.O. BOX 10500
MCLEAN, VA 22102

EXAMINER	
ZAIDI, IQBAL	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/590,209	NAVEN ET AL.	
	Examiner	Art Unit	
	IQBAL ZAIDI	2464	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *03* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 June 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14,19-24,26-41 and 48* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *15-18, 42-47* is/are allowed.

6)☐ Claim(s) _____ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This office action is in response to applicant's amendment filed on Jun 29, 2010 for Application No. 10/590209.

2. Claims 1-14, 19-24, 26-41 and 48, are pending in this application.

Claim Rejections - 35 USC § 101

3. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 19-25, 36-38 and 41 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

In claims 19-25, 36-38 and 41, applicant has claimed "a signalling protocol". When applying the broadest reasonable interpretation of the claims they covers a software operation system *per*.

Therefore, **claims 19-25, 36-38 and 41** are directed to non-statutory subject matter as computer programs, per se.

Allowable Subject Matter

4. **Claims 15-18 and 42-47** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. **Claims 29, 31, 33, 34, 36, 39 and 41** are rejected under 35 U.S.C 102(e) as being anticipated by Mayhew et al (US 20100118703, May 13, 2010) (Hereinafter Mayhew et al).

Regarding **claim 29**, Mayhew discloses a switch for use in a network of switches, the switch comprising a plurality of ingress ports for receiving data packets*(page 5, par(0050-51), line 1-3, ingress port 4 and ingress port 5(plurality of ingress ports)*; a plurality of output-ports for transmitting data packets*(page 2, par(0018), line 3-5, switches, are capable of receiving packets of information via a plurality of input ports and then transmitting these packets via a plurality of output ports, preferably via an output port)*; and control means for selectively routing data packets received at one or more of the ingress ports to one or more of the egress ports*(page 2, par(0018), line 3-5, switches, are capable of receiving packets of information via a plurality of input ports and then transmitting these packets via a plurality of output ports, preferably via an*

output port); wherein at least one of the ingress ports or egress ports comprises storage for Storing details of a congestion tree comprising at least three connected ports in which in use, the switch is located*(page 7, par(0075), line 3-5, See Fig 1, shows three connected ports, Switch 30 receives the DLLP, and stores the relevant information concerning the congested port in a memory element inside the switch)*.

Regarding **claim 31**, Mayhew discloses at least one of the ingress or egress ports is configured in use to generate a set aside queue in response to a request received by the ingress or egress port containing information about congestion at a downstream port, the request containing information about a congested route between the switch and the downstream port*(page 7, par(0071), line 5-10, a switch group together the lowest three traffic classes into a single set of queues. In this case, once one of these three classes becomes congested, all three are congested since they share common queues. By implementing a bit map to identify the congested traffic classes, a switch is able to inform the upstream switch of all traffic classes which are impacted with a single message)*.

Regarding **claim 33**, Mayhew discloses the ingress or egress engine are embodied in a content addressable memory*(page 7, par(0075), line 1-3, stores the relevant information concerning the congested port in a memory element inside the switch)*.

Regarding **claim 34**, Mayhew discloses switch being controllable, when connected in a network of switches to execute the method of congestion management within a switch or network of connected switches wherein the or each of the switches has a plurality of ingress ports and a plurality of egress ports*(page 2, par(0018), line 3-5, switches, are capable of receiving packets of information via a plurality of input ports and then transmitting these packets via a plurality of output ports, preferably via an output port)*, the method comprising when congestion is detected at a first ingress or egress port, sending a message to an upstream port connected to the first ingress or egress port indicating that congestion has occurred at a particular port and requesting storage at the upstream port of data packets destined for that port*(page 7, par(0071), line 5-10, a switch group together the lowest three traffic classes into a single set of queues. In this case, once one of these three classes becomes congested, all three are congested since they share common queues. By implementing a bit map to identify the congested traffic classes, a switch is able to inform the upstream switch of all traffic classes which are impacted with a single message)*; and in dependence on the amount of data packets destined for the congested port stored at said upstream port, sending from the upstream port to a further upstream port a message informing said further upstream port of the congestion at the first ingress or egress congested port, said further upstream port storing at said further upstream port data packets destined for the first ingress or egress congested port*(page 1, par(0006), line 2-8, a switch which is experiencing congestion at one of its output ports can transmit a special message, known as a Data Link Layer Packet (DLLP) to an adjacent upstream switch. This DLLP*

contains multiple fields, one of which contains the output port that is experiencing the congestion and another that specifies the desired action that the upstream switch should take in response to the congestion).

Regarding **claim 36**, Mayhew discloses a signalling protocol for managing congestion within a network of switches*(page 1, par(0005), line 2-8, AS is a multi-point, peer-to-peer switched interconnect standard offering encapsulation of any protocol, multiple messaging mechanisms)*, the protocol comprising a first message for sending from a first port at which congestion is detected to an upstream port connected to the first port, the first message requesting storage of data packets received by said upstream port destined for the congested first port *(page 1, par(0006), line 2-8, a switch which is experiencing congestion at one of its output ports can transmit a special message, known as a Data Link Layer Packet (DLLP) this DLLP contains multiple fields, one of which contains the output port that is experiencing the congestion and another that specifies the desired action that the upstream switch should take in response to the congestion)*; and a second message for sending by the upstream port to a port further upstream when a threshold amount of data packets destined for the congested first port have been received and stored by the said upstream port, said message requesting storage of data packets destined for the congested first port received by said further upstream port*(page 1, par(0006), line 2-8, a switch which is experiencing congestion at one of its output ports can transmit a special message, known as a Data Link Layer Packet (DLLP) to an adjacent upstream switch(further upstream). This DLLP contains*

multiple fields, one of which contains the output port that is experiencing the congestion and another that specifies the desired action that the upstream switch should take in response to the congestion).

Regarding **claim 39**, Mayhew discloses an end station for use in a network of interconnected switches*(page 1, par(0005), line 7-8, AS is a multi-point, peer-to-peer switched interconnect standard offering encapsulation of any protocol)*, the end station comprising an ingress port for receiving data packets from a network to which in use the end station is connected*(page 9, par(0098), line 1-3, The value of the forward turn number from the ingress port for endpoint 100)*;

an egress port for providing data packets to a network to which in use the end station is connected*(page 9, par(0098), line 1-3, The value of the forward turn number from the ingress port for endpoint 100, and the egress port for Switch B)*;

in which the egress port includes means operable in use to receive a message from a downstream port, the message containing data relating to a congested port further downstream than the downstream port and a request to provide storage for data packets destined for the congested port further downstream*(page 1, par(0006), line 2-8, a switch which is experiencing congestion at one of its output ports can transmit a special message, known as a Data Link Layer Packet (DLLP) to an adjacent upstream switch(further upstream). This DLLP contains multiple fields, one of which contains the output port that is experiencing the congestion and another that specifies the desired action that the upstream switch should take in response to the congestion)*.

Regarding **claim 41**, Mayhew discloses configured for use within the signalling protocol of for managing congestion within a network of switches*(page 1, par(0005), line 2-8, AS is a multi-point, peer-to-peer switched interconnect standard offering encapsulation of any protocol, multiple messaging mechanisms)*, the protocol comprising a first message for Sending from a first port at which congestion is detected to an upstream port connected to the first port *(page 1, par(0006), line 2-8, a switch which is experiencing congestion at one of its output ports can transmit a special message, known as a Data Link Layer Packet (DLLP) this DLLP contains multiple fields, one of which contains the output port that is experiencing the congestion and another that specifies the desired action that the upstream switch should take in response to the congestion)*, the first message requesting establishment at the upstream port of a set aside queue for storing data packets received by the upstream switch destined for the source of congestion*(page 1, par(0004), line 2-5, a system and method of implementing multiple queues within a switching element to store packets destined for congested paths. Briefly, the switch determines the path of the packet, specifically, the action to be taken by the adjacent downstream switch, to determine whether it is destined for a congested path)*, the message including a token for storage by said upstream port*(page 1, par(0004), line 2-3, a switching element to store packets destined for congested paths).*

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. **Claims 1-14 and 48** are rejected under 35 U.S.C. 103(a) as being unpatentable over Calvignac (EP 0717532, Dec, 13, 1994) in view of Carlsen et al. (US 20050088969, Apr. 28, 2005) (hereinafter Carlsen) .

Regarding **claim 1**, Calvignac discloses a method of Congestion management within a switch or network of connected switches wherein the or each of the switches has a plurality of ingress ports and a plurality of egress ports *(abstract, a traffic control apparatus implemented in a virtual path ATM communication system comprising a plurality of hops interconnected by physical links which comprise virtual paths including a plurality of Virtual channels)*, the method comprising when congestion is detected at a first ingress or egress port, sending a message to an upstream port connected to the first ingress or egress port indicating that congestion has occurred at a particular port *(column 5, lines 40-47, see Fig 7 When a congestion occurs in a hop located downstream to the hop 50 due to the excessive throughput of one connection issued from hop 50, the flow control of said downstream node may send a selective backpressure primitive to upstream node 50 in order to stop the data traffic on the connection which is responsible for the congestion)* and requesting storage at the

upstream port of data packets destined for that port *(column 4, lines 55-60, the ATM label of said received cell is found in the content addressable memory, a queue corresponding to said cell label is already defined in said hop)*.

Calvignac discloses all aspects of the claimed invention, except *in dependence on the amount of data packets destined for the congested port stored at said upstream port, sending from the upstream port to a further upstream port a message informing said further upstream port of the congestion at the first ingress or egress congested port, said further upstream port storing at said further upstream port data packets destined for the first ingress or egress congested port.*

Carlsen is the same field of invention teaches in dependence on the amount of data packets destined for the congested port stored at said upstream port*(page 2, par(0012), line 2-5, The cell credit manager tracks credits associated with each virtual output queue in order to obtain knowledge about the amount of data within each queue, If the credit count in the cell credit manager drops below a threshold value, the cell credit manager views the associated port as a congested port and asserts an XOFF signal)*, sending from the upstream port to a further upstream port a message informing said further upstream port of the congestion at the first ingress or egress congested port*(page 2, par(0012), line 2-8, The XOFF signal of the cell credit manager is received by a plurality each ingress to the switch, and assigns the designated destination port to the indicated status)*, said further upstream port storing at said further upstream port data packets destined for the first ingress or egress congested port*(page 10, line 2-8,*

the master credit module directs the slave credit modules to submit congestion updates to their subset of served ports).

Calvignac and Carlsen are analogous art because they are from the same field of endeavor of access to a service device.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teaching of Calvignac to include the teaching of Carlsen because it is providing techniques for noticing port congestion and information ingress ports of the congestion, which utilizing a switch that submit data to a crossbar component for making connections to a destination port.

Regarding **claim 2**, Calvignac discloses all aspects of the claimed invention, except *upstream port, allocating memory for use as a set-aside- queue for data packets destined for the congested port.*

Carlsen is the same field of invention teaches upstream port, allocating memory for use as a set-aside- queue for data packets destined for the congested port *(page 4, par(0048), line 8-10, the deferred queue 402 stores the frame headers and locations in buffer memory 320 for frames waiting to be sent to a destination port 114 that is currently busy. The backup queue 404 (set-aside-queue)stores the frame headers and buffer locations for frames that arrive at the input port 112 while the deferred queue 402 is sending deferred frames to their destination)*.

Regarding **claim 3**, Calvignac discloses all aspects of the claimed invention, except *upstream port creating an entry in a memory to indicate that congestion has occurred at the particular port ; and, checking packets subsequently received at the upstream port against the entry in the memory and, if a packet is directed to the congested port, storing said packet in the corresponding set aside queue.*

Carlsen is the same field of invention teaches upstream port creating an entry in a memory to indicate that congestion has occurred at the particular port ; and, checking packets subsequently received at the upstream port against the entry in the memory and, if a packet is directed to the congested port, storing said packet in the corresponding set aside queue *(page 4, par(0048), line 8-10, the deferred queue 402 stores the frame headers and locations in buffer memory 320 for frames waiting to be sent to a destination port 114 that is currently busy(indicate congestion). The backup queue 404 (set-aside-queue)stores the frame headers and buffer locations for frames that arrive at the input port 112 while the deferred queue 402 is sending deferred frames to their destination)*.

Regarding **claim 4**, Calvignac discloses all aspects of the claimed invention, except *within the upstream port, allocating one or more set aside queues in dependence on messages received from the first port.*

Carlsen is the same field of invention teaches within the upstream port, allocating one or more set aside queues in dependence on messages received from the first port

(page 10, and ingress memory subsystem so as to establish a separate queue for each destination on the switch).

Regarding **claim 5**, Calvignac discloses all aspects of the claimed invention, except *within the upstream port controlling data flow into and out of the set aside queue in dependence on the congestion.*

Carlsen is the same field of invention teaches within the upstream port controlling data flow into and out of the set aside queue in dependence on the congestion *(page 1, par(0008), line 8-16, Deferred queuing requires that all incoming data frames that are destined for a congested port be placed in a deferred queue, which keeps these frames from unduly interfering with frames destined for uncongested ports. This technique requires a dependable method for determining the congestion status for all destinations at each input port)*.

Regarding **claim 6**, Calvignac discloses all aspects of the claimed invention, except *de- allocating the one of more set aside queues in dependence on one or more criteria.*

Carlsen is the same field of invention teaches de- allocating the one of more set aside queues in dependence on one or more criteria *(page 4, The memory controller 310 identifies new Fibre Channel frames arriving in credit memory 320, and shares the frame's destination ID and its location in credit memory 320 with the inbound routing module 330)*.

Regarding **claim 7**, Calvignac discloses all aspects of the claimed invention, except *which the one or more criteria include the amount of data in the set aside queue.*

Carlsen is the same field of invention teaches which the one or more criteria include the amount of data in the set aside queue *(page 4, The memory controller module 310 is responsible for storing the incoming data frame on the inbound frame buffer memory 320. Each port 110 on the PPD 130 is allocated a separate portion of the buffer 320)*.

Regarding **claim 8**, Calvignac discloses all aspects of the claimed invention, except *which the message requesting establishment of a set aside queue is discarded by the upstream port if the congestion identified in the request is further downstream than the original congestion.*

Carlsen is the same field of invention teaches which the message requesting establishment of a set aside queue is discarded by the upstream port if the congestion identified in the request is further downstream than the original congestion *(page 1, flow control technique monitors the congestion status of all destination ports at the downstream switch, if a destination port becomes congested, the flow control process determines which virtual channel on the ISL is affected, and sends an message so informing the upstream switch. The upstream switch will then stop sending data on the affected virtual channel)*.

Regarding **claim 9**, Calvignac discloses all aspects of the claimed invention, except *in which the message indicating that congestion has occurred includes a token to be kept by the upstream port to identify the upstream port as a leaf port within a congestion tree.*

Carlsen is the same field of invention teaches in which the message indicating that congestion has occurred includes a token to be kept by the upstream port to identify the upstream port as a leaf port within a congestion tree *(page 1, flow control technique monitors the congestion status of all destination ports at the downstream switch, if a destination port becomes congested, the flow control process determines which virtual channel on the ISL is affected, and sends an message so informing the upstream switch. The upstream switch will then stop sending data on the affected virtual channel)*.

Regarding **claim 10**, Calvignac discloses all aspects of the claimed invention, except *storing data about the number of leaves in the congestion tree in each switch in the tree.*

Carlsen is the same field of invention teaches storing data about the number of leaves in the congestion tree in each switch in the tree *(page 5, a separate is established for every destination within the switch 270. In switch 270, this means that there are at least five hundred forty-four V-0-Qs 290 in iMS 180. The iMS 180 places incoming data on the appropriate V-0-Q 290 according to the switch destination address assigned to that data by the routing module 330 in PPD 272)*.

Regarding **claim 11**, Calvignac discloses all aspects of the claimed invention, except *which when a set aside queue is de-allocated, the leaf token is returned by the upstream switch to the adjacent downstream switch, the method comprising maintaining a record relating to leaf switches that have returned a leaf token.*

Carlsen is the same field of invention teaches in which when a set aside queue is de-allocated, the leaf token is returned by the upstream switch to the adjacent downstream switch, the method comprising maintaining a record relating to leaf switches that have returned a leaf token *(page 5, The cells are then removed from the 0-COS-Q 280 and are submitted to the PPD 262 for the egress port 114, which converts the cells back into a Fibre Channel frame and sends it across the ISL 230 to the downstream switch 270)*.

Regarding **claim 12**, Calvignac discloses all aspects of the claimed invention, except *when a subsequent packet is received by the upstream port, if it is destined for the congestion, storing it in a set aside queue, and if it is not destined for the congestion, storing it in a cold queue at the upstream port.*

Carlsen is the same field of invention teaches when a subsequent packet is received by the upstream port*(page 1, sends an XOFF message so informing the upstream switch)*, if it is destined for the congestion, storing it in a set aside queue, and if it is not destined for the congestion, storing it in a cold queue at the upstream port*(page 4, page 4, See Fig 1,shows queue control module 400 which shows The*

queue control module 400 has four primary components, namely the deferred queue 402, the backup queue 404, the header select logic 406, and the XOFF mask 408, these components work in conjunction with the XON History register 420 and the cell credit manager or credit module 440 to control ingress queuing and to assist in managing flow control within switch 100. The deferred queue 402 stores the frame headers and locations in buffer memory 320 for frames waiting to be sent to a destination port 114).

Regarding **claim 13**, Calvignac discloses all aspects of the claimed invention, except *when a packet is received at the upstream port that is destined for the congestion, storing a marker in the cold queue to provide an indication of the order in which the congestion-bound packet was received with respect to packets already in the cold queue which are also destined for the congestion.*

Carlsen is the same field of invention teaches when a packet is received at the upstream port that is destined for the congestion*(page 4, See Fig 1,shows the deferred queue 402 stores the frame headers and locations in buffer memory 320 for frames waiting to be sent to a destination port 114)*, storing a marker in the cold queue to provide an indication of the order in which the congestion-bound packet was received with respect to packets already in the cold queue which are also destined for the congestion*(page 7, the defer signal 414 will also be set, effectively stopping all traffic, when the defer signal 414 is set, it informs the header select logic 406 and the remaining elements of the queue module 400 that the port 110 having the address on*

next frame header output 415 is congested, and this frame should be stored on the deferred queue 402).

Regarding **claim 14**, Calvignac discloses the memory is provided as an associative memory*(column 4, lines 40-47, the look-up device is a content addressable memory).*

Regarding **claim 48**, Calvignac discloses all aspects of the claimed invention, except *at said further upstream port, allocating memory for use as a set-aside-queue for data packets destined for the first ingress or egress congested port.*

Carlsen is the same field of invention teaches at said further upstream port, allocating memory for use as a set-aside-queue for data packets destined for the first ingress or egress congested port *(page 1, par(0008), line 15-17, Deferred queuing requires that all incoming data frames that are destined for a congested port be placed in a deferred queue).*

9. **Claims 19-24** are rejected under 35 U.S.C. 103(a) as being unpatentable over Carlsen et al. (US 20050088969, Apr. 28, 2005) in view of Calvignac (EP 0717532, Dec, 13, 1994), (hereinafter Calvignac) .

Regarding **claim 19**, Carlsen discloses the message including a token for storage by said upstream port*(page 1, the flow control process determines which virtual*

channel on the ISL is affected, and sends the message so informing the upstream switch. The upstream switch will then stop sending data on the affected virtual channel), the protocol operating such that when said congestion clears, the established set aside queue is de-allocated and the corresponding token is passed downstream in the direction of the previously congested port *(page 5, The cells are then removed from the 0-COS-Q 280 and are submitted to the PPD 262 for the egress port 114, which converts the cells back into a Fibre Channel frame and sends it across the ISL 230 to the downstream switch 270)* in which when a certain amount of data packets are stored within the set aside queue in said upstream port a message containing a token is sent by said upstream port to a further upstream port requesting establishment of a set aside queue at said further upstream port for storage of data packets destined for the first port at which congestion has been detected*(page 1, flow control technique monitors the congestion status of all destination ports at the downstream switch, if a destination port becomes congested, the flow control process determines which virtual channel on the ISL is affected, and sends the message so informing the upstream switch. The upstream switch will then stop sending data on the affected virtual channel)*.

Carlsen discloses all aspects of the claimed invention, except *a signalling protocol for managing congestion within a network of switches, the protocol comprising a first message for sending from a first port at which congestion is detected to an upstream port connected to the first port, the first message requesting establishment at the upstream port of a set aside queue for storing data packets received by the upstream switch destined for the source of congestion port.*

Calvignac is the same field of invention teaches a signalling protocol for managing congestion within a network of switches, the protocol comprising a first message for sending from a first port at which congestion is detected to an upstream port connected to the first port*(column 5, lines 40-47, see Fig 7 When a congestion occurs in a hop located downstream to the hop 50 due to the excessive throughput of one connection issued from hop 50, the flow control of said downstream node may send a selective backpressure primitive to upstream node 50 in order to stop the data traffic on the connection which is responsible for the congestion)*, the first message requesting establishment at the upstream port of a set aside queue for storing data packets received by the upstream switch destined for the source of congestion port *(column 4, lines 55-60, the ATM label of said received cell is found in the content addressable memory, a queue corresponding to said cell label is already defined in said hop)*.

Calvignac and Carlsen are analogous art because they are from the same field of endeavor of access to a service device.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teaching of Calvignac to include the teaching of Carlsen because it is providing a technique for noticing port congestion and informing ingress ports of the congestion.

Regarding **claim 20**, Carlsen discloses a protocol according to claim 19, comprising an acknowledgement message for sending from the upstream port to the first port to confirm establishment of the requested set aside queue*(page 10, and*

ingress memory subsystem so as to establish a separate queue for each destination on the switch).

Regarding **claim 21**, Carlsen discloses a flow control message for sending from the first port to the upstream port including data relating to the congestion at the first port*(page 10, organizing the ingress memory subsystem so as to establish a separate queue for each destination on the switch)*.

Regarding **claim 22**, Carlsen discloses a notification for sending from the upstream port to the first port informing the first port of de- allocation of the set aside queue when a set aside queue is no longer required*(page 7, a force defer signal that is controlled by the microprocessor 124 is also able to cause the defer signal 414 to go on. When the defer signal 414 is set, it informs the header select logic 406 and the remaining elements of the queue module 400 that the port 110 having the address on next frame header output 415 is congested, and this frame should be stored on the deferred queue 402)*.

Regarding **claim 23**, Carlsen discloses a message for informing the first port that the upstream port has de-allocated an old set aside queue*(page 7, the defer signal 414 is set, it informs the header select logic 406 and the remaining elements of the queue module 400 that the port 110 having the address on next frame header output 415 is congested, and this frame should be stored on the deferred queue 402)*.

Regarding **claim 24**, Carlsen discloses a message for sending to the upstream port from the first port instructing the upstream port to modulate its rate of packet transmission to a specified downstream set aside queue *(page 2, See Fig. 4, FIG. 4 is a block diagram showing the queuing utilized in an upstream switch and a downstream switch communicating over an interswitch link)*.

25. (Cancelled).

10. **Claims 26-28, 30, 32, 35 37-38, 40** are rejected under 35 U.S.C. 103(a) as being unpatentable over Mayhew et al (US 20100118703, May 13, 2010) in view of Carlsen et al. (US 20050088969, Apr. 28, 2005) (hereinafter Carlsen) .

Regarding **claim 26** , Mayhew discloses request generation means arranged to send a request to a further upstream port to request storage of data packets destined for the downstream congested port at said further upstream port when a threshold amount of data packets destined for the downstream congested port are stored in the Storage*(page 1, par(0006), line 2-8, a switch which is experiencing congestion at one of its output ports can transmit a special message, known as a Data Link Layer Packet (DLLP) to an adjacent upstream switch. This DLLP contains multiple fields, one of which contains the output port that is experiencing the congestion and another that specifies the desired action that the upstream switch should take in response to the congestion)*.

Mayhew discloses all aspects of the claimed invention, except *a switch for use in a network of switches, the switch comprising two or more ingress ports; two or more egress ports; a switch fabric for selectively coupling data packets received at one or more of the ingress ports to one or more of the egress ports; storage for, in response to a request for storage of data packets destined for a downstream congested port, storing selected data packets; selection means, for selectively routing a received data packet to the storage in dependence on the detected desired destination of the packet.*

Calvignac is the same field of invention teaches a switch for use in a network of switches, the switch comprising two or more ingress ports*(page 6, par(0078), line 4, two ingress ports 112)*; two or more egress ports*(page 7, par(0090), line 3, all egress ports 114)*; a switch fabric for selectively coupling data packets received at one or more of the ingress ports to one or more of the egress ports*(page 5, par(0057), line 7-10, The microprocessor 124 also uses the microprocessor interface 360 to communicate with the ports 110 and with other processors 124 over the cell-based switch fabric)*; storage for, in response to a request for storage of data packets destined for a downstream congested port, storing selected data packets*(page 1, par(0009), line 12-15, the flow control technique monitors the congestion status of all destination ports at the downstream switch)*; selection means, for selectively routing a received data packet to the storage in dependence on the detected desired destination of the packet*(page 1, par(0006), line 12-15, the switch uses a routing table and the source and destination information found within the Fibre Channel frame header to route the Fibre Channel frames from one port to another)*.

Mayhew and Carlsen are analogous art because they are from the same field of endeavor of access to a service device.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teaching of Calvignac to include the teaching of Carlsen because it is providing a technique for noticing port congestion and informing ingress ports of the congestion.

Regarding **claim 27** , Mayhew discloses the selection means comprises a content addressable memory*(page 7, par(0075), line 1-3, stores the relevant information concerning the congested port in a memory element inside the switch).*

Regarding **claim 28**, Mayhew discloses all aspects of the claimed invention, except *a set aside queue is only formed in response to the request if one or more of a number of criteria are satisfied*.

Carlsen is the same field of invention teaches a set aside queue is only formed in response to the request if one or more of a number of criteria are satisfied*(page 4, Each port 110 on the PPD 130 is allocated a separate portion of the buffer, the memory controller 310 identifies new Fibre Channel frames arriving in credit memory 320, and shares the frame's destination ID and its location in credit memory 320 with the inbound routing module 330)*.

Regarding **claim 30**, Mayhew discloses all aspects of the claimed invention, except *at least one of the ingress or egress ports comprises means for generating a set aside queue for storage of received data packets destined for a port in the congestion tree.*

Carlsen is the same field of invention teaches at least one of the ingress or egress ports comprises means for generating a set aside queue for storage of received data packets destined for a port in the congestion tree *(page 4, See Fig 1,shows queue control module 400 which shows The queue control module 400 has four primary components, namely the deferred queue 402, the backup queue 404, the header select logic 406, and the XOFF mask 408, these components work in conjunction with the XON History register 420 and the cell credit manager or credit module 440 to control ingress queuing and to assist in managing flow control within switch 100. The deferred queue 402 stores the frame headers and locations in buffer memory 320 for frames waiting to be sent to a destination port 114)*.

Regarding **claim 32** , Mayhew discloses at least one of the ingress or egress ports comprises an ingress or egress engine configured in use to receive a data packet*(page 2, par(0018), line 3-5, switches, are capable of receiving packets of information via a plurality of input ports)*; determine from the data packet its eventual destination*(page 3, par(0021), line 3-5, When switch 20 receives a packet, it determines the destination address of the packet, indexes into its table and selects the appropriate output port)*.

Mayhew discloses all aspects of the claimed invention, except *if the data packet is destined for a congested port to store the packet in the set aside queue and if it is destined for an uncongested port to store the packet in a Cold queue for transmission to the uncongested port.*

Carlsen is the same field of invention teaches if the data packet is destined for a congested port to store the packet in the set aside queue and if it is destined for an uncongested port to store the packet in a Cold queue for transmission to the uncongested port *(page 1, Deferred queuing requires that all incoming data frames that are destined for a congested port be placed in a deferred queue (cold queue), which keeps these frames from unduly interfering with frames destined for uncongested ports. This technique requires a dependable method for determining the congestion status for all destinations at each input port)*.

Regarding **claim 35** , Mayhew discloses a network of interconnected switches connected in a topology, the network comprising a plurality of switches wherein at least two of the switches are switches according to claim 26*(see Fig 1, shows two of the switches 20 , 30, 40 are interconnected network switches)*.

Regarding **claim 37**, Mayhew discloses all aspects of the claimed invention, except *when storage is requested by either a message from the congested port or the message form said upstream port, said upstream port and said further upstream port respectively are controlled to allocate a set aside queue at said upstream port or at said*

further upstream port respectively for storage of data packets destined for the congested port.

Carlsen is the same field of invention teaches when storage is requested by either a message from the congested port or the message form said upstream port(*page 1, This flow control technique monitors the congestion status of all destination ports at the downstream switch. If a destination port becomes congested, the flow control process determines which virtual channel on the ISL is affected, and sends an message so informing the upstream switch)*, said upstream port and said further upstream port respectively are controlled to allocate a set aside queue at said upstream port or at said further upstream port respectively for storage of data packets destined for the congested port(*page 1, par(0006), line 12-15, the switch uses a routing table and the source and destination information found within the Fibre Channel frame header to route the Fibre Channel frames from one port to another)*.

Regarding **claim 38**, Mayhew discloses all aspects of the claimed invention, except *when the set-aside-queue at either or both of said upstream port and said further upstream port have become empty said set- aside, queue may be de allocated.*

Carlsen is the same field of invention teaches when the set-aside-queue at either or both of said upstream port and said further upstream port have become empty said set- aside, queue may be de allocated *(page 7, a force defer signal that is controlled by the microprocessor 124 is also able to cause the defer signal 414 to go on. When the defer signal 414 is set, it informs the header select logic 406 and the remaining*

elements of the queue module 400 that the port 110 having the address on next frame header output 415 is congested, and this frame should be stored on the deferred queue 402).

Regarding **claim 40**, Mayhew discloses all aspects of the claimed invention, except *a control device operable in use to, in response to the message received from the network, allocate a set-aside queue for storing of data packets destined for the congested port.*

Carlsen is the same field of invention teaches a control device operable in use to, in response to the message received from the network, allocate a set-aside queue for storing of data packets destined for the congested port *(page 10, and ingress memory subsystem so as to establish a separate queue for each destination on the switch)*.

Response to Argument

11. Applicant's arguments with respect to **claims 19, 36 and 41** have been considered. However, Examiner respectfully disagrees with Applicant's arguments and would like to provide a further clarification regarding the interpretation of the cited references.

12. In response to the argument on page 11 of Applicant's Remark, Examiner does not interpret "signalling protocol" is a hardware. In fact, Examiner interprets the "signalling protocol" is a software to control the switch.

13. Applicant's arguments, see pages 11 to 20 of the Applicant's Remark, filed 06/29/2010, with respect to the rejection(s) of claims 1-47 under 35 USC § 103(a) have been fully considered and are persuasive. Therefore, the rejections have been withdrawn. However, upon further consideration, a new ground(s) of rejections are made in view of Mayhew et al (US 20100118703,, Carlsen et al (20050088969, Apr. 28, 2005), Calvignac (EP 0717532, Dec, 13, 1994).

Conclusion

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure are:

Any inquiry concerning this communication or earlier communications from the examiner should be directed to IQBAL ZAIDI whose telephone number is (571)270-3897. The examiner can normally be reached on 7:30a.m to 5:00p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, NGO RICKY can be reached on 571-272-3139. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/Ricky Ngo/ IZ
Supervisory Patent Examiner, Art Unit 2464